

Remarks

Claims 8-10 of this application have been rejected under 35 U.S.C. §103 as unpatentable over published German Patent Application No. DE 42 43 424 of Stach et al. (Stach) taken in view of published PCT Application No. WO 98/38147 of Schanke et al. (Schanke). This rejection is respectfully traversed, and reconsideration of this application is respectfully requested, on the basis of the following comments.

The Stach reference describes a bubble loop reactor for carrying out a two-stage process involving two successive catalytic reactions. A full translation of that reference is being provided for consideration by the Examiner.

Because the two catalytic reactions of Stach may occur at different rates, the Stach reactors utilize different quantities of two catalysts. In relevant embodiments, stacked catalyst columns that employ catalyst beds of larger cross-section for one reaction and smaller cross-section for the other are disclosed (Figs. 1-6 of the drawings).

It is clear from the translation being submitted herewith that the Stach reactor does not meet the Applicants' requirement for processing through a flow-connecting, end-to-end catalyst stack that is effective to avoid the unchanneled flow of feed stream portions from one bed to another (claim 10 of the above-entitled application). To the contrary, the Stach reactors referenced by the Examiner are specifically designed to create intermediate spaces wherein a free convective flow of reactant liquid may occur (page 3, third full paragraph of the translation). Thus, in effect, the Stach invention requires that unguided flow of the reactants occur within one or more sections of the catalyst bed.

In applying Stach against the present claims the Examiner suggests that unguided flow is effectively avoided over certain portions of the recirculation loops used in the Stach process. However, even if such flow is assumed to occur, Stach as a whole cannot be taken to actually suggest a reactor or process that utilizes only a portion of the disclosed reactant flow loop. Clearly, adopting such a process would require a complete departure from the Stach invention, i.e., abandoning any process involving catalysts of differing size and/or shape wherein unguided reactant flow through at least a portion of the catalyst bed is expressly relied on for two-stage

reaction control. Such a modification of Stach cannot in any respect be deemed an obvious modification of its teachings.

In framing the rejection of claims 8-10 under 35 U.S.C. §103 the Examiner has appropriately recognized that Stach does not teach adjusting feed stream composition to develop Taylor flow conditions in the manner required by those claims. To remedy this deficiency the Examiner relies on Schanke to show the advantages of Taylor flow in a honeycomb catalyst column, and concludes from those advantages that it would have been obvious to operate the Stach reactor in a Taylor flow mode.

This conclusion is contrary to the teachings of the references. The Stach reactor is a bubble loop reactor, and like other bubble and slurry reactors is designed to operate as a "perfectly mixed" reactor. Thus it comprises gas dispersing devices (such as device 6 in Fig. 1 of the reference) that are designed to produce substantial size reduction and dispersion of the gas phase throughout the liquid phase, thereby to achieve effective mass transfer between those phases. (page 2, second full paragraph of Stach).

Bubble loop reactors like those in Stach are clearly not designed to support the plug or Taylor flow taught in Schanke, which does not involve extensive reactant mixing. To the contrary the Schanke reactor is designed to prevent back-mixing through the use of narrow tubular channels running in uninterrupted fashion from one end of the reactor to the other (page 7, lines 1-12 of the reference).

For the above reason the skilled artisan would understand that implementing Taylor flow in the Stach reactor would require extensive reactor and/or process modifications. Moreover, the result of such modifications would be that the reactor would no longer be unusable for effectively managing two-stage processes requiring the coupling of rapid reactions with slow reactions, as Stach expressly requires. Thus implementing Taylor flow in the Stach reactor would clearly not be an obvious modification of that reference.

Also significant is the fact that the Schanke reactor does not require the management of liquid reactions or liquid reactivity at any point, since the sole liquid present is product liquid and the sole reactions are F-T (gas-gas) reactions (page 3, line 22 to page 4, line 1 of the patent). The advantages of Taylor flow for these processes are reactor temperature control through product recirculation and the

possibility of high single-pass conversions if high reactor heights are used (page 6, lines 26-34 of Schanke).

Clearly these advantages offer little or no benefits vis-à-vis the two-stage bubble loop reactors of Stach, and therefore a proper basis in the references upon which the skilled artisan would be motivated to modify Stach in the manner proposed by the Examiner appears to be lacking.

For all of the above reasons it is respectfully submitted that the process of claims 8-10 of this application is not a process rendered obvious by the teachings of the cited combination of references, but is instead a process that is clearly patentable over those references for the reasons hereinabove set forth. Accordingly, reconsideration and withdrawal of the rejection of claims 8-10 on reference to Stach and Schanke under 35 U.S.C. §103, and allowance of all remaining claims of this application, are courteously solicited.

Applicants believe that no extension of time is necessary to make this Reply timely, but respectfully request the grant of any extension necessary for that purpose under 37 C.F.R. § 1.136(a), and hereby authorize the Patent and Trademark Office to charge any necessary fee or surcharge for any such extension to Deposit Account 03-3325 of Corning Incorporated.

Respectfully submitted,



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DATE: June 10, 2004

Enclosure: PTO 1449